***Demographic Research*** a free, expedited, online journal
of peer-reviewed research and commentary
in the population sciences published by the
Max Planck Institute for Demographic Research
Konrad-Zuse Str. 1, D-18057 Rostock · GERMANY
www.demographic-research.org



*DEMOGRAPHIC RESEARCH*

**VOLUME 22, ARTICLE 27, PAGES 863-890**
**PUBLISHED 07 MAY 2010**
http://www.demographic-research.org/Volumes/Vol22/27/
DOI: 10.4054/DemRes.2010.22.27

*Descriptive Finding*

# Single motherhood and low birthweight in Spain: Narrowing social inequalities in health?

**Teresa Castro-Martín**

# Table of Contents

*Demographic Research*: Volume 22, Article 27
*Descriptive Finding*

# Single motherhood and low birthweight in Spain: Narrowing social inequalities in health?

**Teresa Castro-Martín**[1]

## Abstract

Nonmarital childbearing is becoming an increasingly common path to family formation in Spain. The proportion of births to unmarried mothers has increased from 2% in 1975 to 30.2% in 2007. Along with this marked increase, there has been an important shift in the sociodemographic profile of unmarried mothers. This study focuses on the impact of mothers' marital status on the health status of their newborns, using low birthweight as an indicator. We are interested in examining how the impact of mothers' unmarried status on birth outcomes changes as nonmarital childbearing shifts from a marginal to a relatively common behaviour. The results of the analysis reveal that the health disadvantage gap between marital and nonmarital births has narrowed significantly over the past decade in Spain. We argue that diminishing selection processes and increasing social acceptance could explain the declining significance of marital status as a risk factor for low birthweight.

[1] Instituto de Economía, Geografía y Demografía. Centro de Ciencias Humanas y Sociales, CSIC, Madrid. E-Mail: teresa.castro@cchs.csic.es.

# 1. Introduction

The retreat from marriage and the rise in nonmarital childbearing are significantly transforming the family biographies of women, men and children in numerous societies (Lichter 1995, Seltzer 2000, Kiernan 2001, Raley 2001, Heuveline, Timberlake, and Furstenberg 2003). Out-of-wedlock fertility has been traditionally low in Spain, but during the past decade it has undergone an extraordinary increase. The proportion of births to unmarried mothers rose from 13.1% in 1997 to 30.2% in 2007, i.e. nearly one out of three births occurs nowadays outside the framework of marriage. Nonmarital childbearing has therefore become a common path to family building (Baizán, Aassve, and Billari 2003), and Spain no longer fits the traditional family formation sequence (courtship-marriage without prior cohabitation-first birth) that has long prevailed in Southern Europe (Billari et al. 2003).

This recent –and largely unanticipated– rise in nonmarital fertility is likely to have important repercussions for family dynamics, child welfare and overall social inequality, given the increasing links between social disadvantage and family structure (Wu and Wolfe 2001). A large number of studies have documented a wide range of socioeconomic and health disadvantages faced by children of unmarried mothers (McLanahan and Sandefur 1994, Whitehead, Burström, and Diderichsen 2000), although the extent of disadvantage varies significantly across societies (Christopher et al. 2001).

This paper focuses on the association between marital status and low birthweight, a commonly used indicator of child health and an important predictor of long-term well-being. Our objectives are threefold: (a) to determine whether the disparities in low birthweight by marital status documented for numerous countries are also found in Spain, (b) to ascertain whether the observed gap is partially or entirely due to dissimilar socio-demographic composition of married and unmarried mothers, and (c) to test whether the gap has narrowed over time.

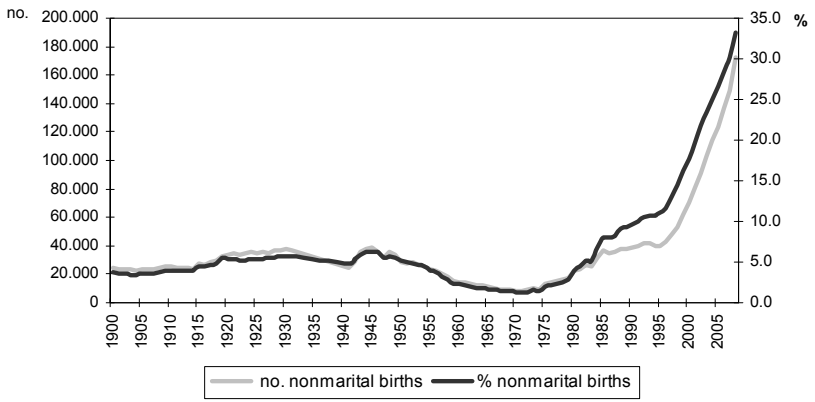
The structure of the paper is as follows. First, we document the recent increase in out-of-wedlock childbearing in Spain and describe the changing sociodemographic profile of unmarried mothers. Next, we review the demographic and epidemiological literature documenting the excess risk of low birthweight associated with unmarried motherhood. In the results section, we present the estimated differentials in low birthweight between marital and nonmarital births, before and after adjusting for mothers' sociodemographic characteristics. Then we explore whether the changing profile of unmarried mothers and the increasing social diffusion of nonmarital childbearing has led to a weakened impact of marital status on birthweight inequalities over the past decade. The last section contains a discussion of the results and some concluding remarks.

## 2. Nonmarital childbearing: an increasingly common path to family formation in Spain

Although out-of-wedlock childbearing was not unknown throughout history in Spain – the proportion of births to unmarried mothers was within the range of 4%-6% in the period from 1900-1930, it was an exceptional behaviour, and childbearing within the context of marriage remained the prevailing norm throughout most of the century (Revuelta and Villuendas 2008). During most of the Franco dictatorship (1939-1975), nonmarital fertility remained at very low levels. The influence of Catholicism, which acquired the status of "official religion" during the dictatorship, shaped politics, legislation, and the education system, endorsing a traditional concept of the family, asymmetric gender relations, and a strict sexual code for women (Nash 1991). In 1970, Spain (with only 1.3% of births occurring out of wedlock) was, together with Greece (1.1%), the European country with the lowest level of nonmarital fertility.

It was not until 1975, coinciding with the transition to a democratic political system, that a sustained upward trend in nonmarital childbearing began (Figure 1). The gradual democratization of political, social and family life, the secularization of the society, women's rapid advancement in education and labour force participation, as well as increasing sexual freedom and tolerance towards private behaviour were some of the social processes that accompanied this trend. The proportion of out-of-wedlock births increased from 2% in 1975 to 8% in 1985 and to 11.1% in 1995. The pace of change accelerated considerably from the second half of the 1990s, and in 2007 nonmarital births accounted for 30.2% of all births.

**Figure 1: Trends in the number and percentage of nonmarital births, 1900-2008**




*Source*: Spanish National Institute of Statistics.

The initial rise in nonmarital fertility during the late 1970s preceded major legislative changes. In 1981 the Civil Code was amended, the concept of illegitimacy eliminated and the equality of rights among births within and outside marriage established. It is also important to mention that in 1978 the ban on contraception was lifted and that since 1985 abortion has become accessible on several grounds (Ruiz Salguero et al. 2005). Since the rapid increase in nonmarital childbearing coincides with a sharp rise in the prevalence of contraception among the unmarried youth (Castro-Martín 2005) and wider access to abortion, a large proportion of out-of-wedlock births can be assumed to be intended.

Although Spain is usually portrayed as a "traditional" society regarding its family patterns, except for its lowest-low fertility,[2] recent trends in nonmarital childbearing suggest a delayed but rapid process of convergence with the rest of Europe. In fact, the current level of nonmarital childbearing in Spain (30.2%) is close to the European average (32% for EU-25), although it remains below that prevailing in Northern Europe.

Attitudes have changed even more rapidly than behaviour and tolerance of a variety of family forms is currently widespread. According to two nationally representative opinion surveys conducted by the Center of Sociological Research in 1992 and 2004, the proportion of respondents that declared that they would consider it a serious problem if a daughter of theirs had a child outside marriage declined from 37.8% in 1992 to 17.3% in 2004.

### 2.1 The changing sociodemographic profile of unmarried mothers

Not only has nonmarital childbearing increased rapidly, but its very nature has profoundly changed. Out-of-wedlock childbearing has been traditionally associated with adolescent unplanned fertility, but this portrayal is no longer accurate. Whereas 24.3% of nonmarital births were born to adolescent mothers in 1980, the corresponding proportion in 2007 was only 8.2%. In turn, during this period, the proportion of nonmarital births to mothers over age 30 increased from 19.9% in 1980 to 46.2% in 2007. Also, the proportion of first births among nonmarital births declined from 77% in 1980 to 69.1% in 2007 (Table 1).

[2] Spain's total fertility rate remained below 1.3, the lowest-low fertility threshold, from 1993 to 2003. In recent years, fertility has experienced a slight increase –partly due to the influence of immigrants' fertility patterns– and reached 1.46 children per woman in 2008. Although rarely acknowledged, the recent increase would not have occurred if nonmarital fertility had remained constant.

**Table 1: Sociodemographic composition of married and unmarried mothers, 1980, 1996 and 2007**

| | | 1980 | | 1996 | | 2007 | |
|---|---|---|---|---|---|---|---|
| | | **Married mothers** | **Unmarried mothers** | **Married mothers** | **Unmarried mothers** | **Married mothers** | **Unmarried mothers** |
| *% births* | | 96.1 | 3.9 | 88.4 | 11.6 | 69.7 | 30.3 |
| *Mother's* | | | | | | | |
| Union status | Cohabiting | | | | | | 66.8 |
| | Lone mother | | | | | | 33.2 |
| Age | <20 | 6.5 | 24.9 | 1.5 | 14.7 | 0.7 | 8.2 |
| | 20-24 | 29.0 | 34.3 | 9.9 | 23.4 | 5.4 | 20.1 |
| | 25-29 | 32.6 | 21.0 | 35.0 | 24.4 | 22.5 | 25.8 |
| | 30-34 | 19.9 | 12.2 | 38.8 | 22.7 | 43.7 | 26.7 |
| | 35-39 | 9.0 | 5.5 | 13.0 | 12.3 | 23.9 | 15.3 |
| | 40+ | 3.0 | 2.1 | 1.8 | 2.6 | 3.9 | 3.8 |
| Labor force status | Inactive | 79.5 | 69.3 | 52.5 | 63.0 | 37.0 | 47.9 |
| | Professional occupation | 6.0 | 5.2 | 17.0 | 9.7 | 21.3 | 11.8 |
| | Other occupation | 14.5 | 25.4 | 30.5 | 27.3 | 41.7 | 40.2 |
| Town size | <20,000 | 35.7 | 24.3 | 33.7 | 26 | 31.5 | 26.7 |
| | 20,000-100,000 | 19.7 | 16.4 | 23.6 | 23.9 | 27.8 | 28.2 |
| | 100,000+ or capital | 44.6 | 59.3 | 42.7 | 50.2 | 40.7 | 45.2 |
| Nationality | Spanish | | | 97.4 | 92.8 | 84.7 | 74.9 |
| | Europe & MDCs | | | 0.9 | 3.1 | 4.0 | 8.1 |
| | LDCs | | | 1.7 | 4.1 | 11.3 | 17.0 |
| Education | Primary | | | | | 10.2 | 21.4 |
| | Secondary I | | | | | 22.2 | 29.6 |
| | Secondary II | | | | | 29.1 | 25.8 |
| | University | | | | | 32.7 | 16.1 |
| | No info. | | | | | 5.8 | 7.1 |
| *Father's* | | | | | | | |
| Birth certificate info. | No age reported | 0.0 | 60.9 | 0.0 | 9.8 | 0.0 | 5.4 |
| Occupation | Professional | 11.7 | 3.5 | 19.6 | 11.2 | 25.9 | 13.9 |
| *Newborn's* | | | | | | | |
| Sex | Boy | 51.9 | 52.2 | 51.5 | 51.5 | 51.6 | 51.6 |
| | Girl | 48.1 | 47.8 | 48.5 | 48.5 | 48.4 | 48.4 |
| Birth order | 1 | 41.4 | 77.0 | 49.3 | 63.2 | 53.4 | 69.1 |
| | 2 | 31.8 | 13.9 | 39.3 | 24.3 | 36.8 | 22.3 |
| | 3+ | 26.8 | 9.0 | 11.3 | 12.5 | 9.8 | 8.7 |
| Gestational age | Full-term | 98.0 | 96.8 | 96.0 | 93.9 | 94.0 | 92.7 |
| | Pre-term | 2.0 | 3.2 | 4.0 | 6.1 | 6.0 | 7.3 |
| N | | 540459 | 22061 | 293959 | 38417 | 314460 | 136651 |

*Note*: The analysis is restricted to singleton births.

Numerous studies have warned against assuming that all births to unmarried women are births to unpartnered mothers (Bumpass and Lu 2000, Sigle-Rushton and McLanahan 2002). In the European context, a large proportion of births classified as nonmarital are actually born to a cohabiting couple (Kiernan 2004), and hence in a family context analogous to that of a married couple, although exposed to higher risks of disruption (Manning, Smock, and Majumdar 2004). Furthermore, although a birth to a lone mother reduces her chances of marrying in the future (Bennet, Bloom, and Miller 1995), a birth within a cohabitating union increases the probability that the parents will marry in the short term (Manning 1995); hence, many of the children born to non-married mothers will actually be raised in a marital context.

Although cohabitation is becoming increasingly common among young generations in Spain (Domínguez-Folgueras and Castro-Martín 2008) and data from the latest 2001 census confirm that cohabitation is not merely a childless stage before marriage –39% of cohabitating partners have children in common (Castro-Martín and Domínguez-Folgueras 2008)–, birth registers in Spain have traditionally collected only the legal marital status of the parents and not their *de facto* family situation. It is not until 2007 that information on parents' cohabiting status and on a mother's and father's home address is introduced in the birth certificate. Possibly due to the novelty, there is a large non-response rate to the question on cohabitation (22% among unmarried women). However, if we combine the information on declared cohabitation and the information on whether the father lives at the same address as the mother for those unmarried women who did not respond to the question of cohabitation, the outcome is that about two-thirds (66.8%) of nonmarital births (which represent 20.2% of all births in 2007) correspond to cohabiting couples, and only one-third correspond strictly to lone mothers. This level is significantly higher than previous estimates based on the 1995 *Fertility and Family Survey*, which indicated that 42%[3] of nonmarital first births corresponded to women in cohabiting unions (Castro-Martín 2007).

Concomitant to the rise in nonmarital births where parents are cohabiting, there has been a dramatic increase in the legally acknowledged paternity of nonmarital children. Although Spain does not have official statistics on this important issue, we can infer them through an indirect indicator, proposed by Muñoz-Pérez (2003): the proportion of nonmarital births for which the father's age is reported at the birth registry. Whereas only 39.1% of all nonmarital births registered the father's age in 1980, the corresponding proportion in 2007 reached 94.5% (Table 1). This is a crucial development because the legal and financial responsibilities of unmarried fathers to

[3] This estimate refers to all first nonmarital births born to women aged 18-49, but the proportion varies significantly according to mothers' birth cohort: whereas among women born in the late 1940s, only 27% of nonmarital births were to cohabiting mothers, the proportion reached 50% among women born in the 1970s.

their children can only be enforced if paternity is formally established (Hirczy de Miño 2000, Guzzo 2009).

Another important shift in the profile of unmarried mothers is linked to the rapid growth of immigration that Spain has experienced since the mid-1990s (Arango 2000). Whereas in the 1991 Census the foreign population comprised less than 1% of the total population, according to the continuous population register, in January 2009 they represented 12% of the overall population. This rapid increase has greatly influenced recent demographic dynamics, including fertility levels and nonmarital fertility patterns (Roig and Castro-Martín 2007). In 2007, 18.9% of all births in Spain were to foreign mothers, but if we focus on nonmarital fertility, the share of foreign mothers was even larger: 25.9%. The immigrant population is, however, a heterogeneous population and the prevalence of nonmarital childbearing varies greatly according to region of origin. The nonmarital fertility ratio is highest among Latin American women (59.5%) and lowest among Northern African women (9.6%).

Besides the demographic profile of unmarried mothers, it is relevant to examine their education and work profile, since the opportunities and disadvantages of children born out-of-wedlock are largely conditioned by the socioeconomic level of their mothers, especially in those households where the father is not present. Even though education and labour force participation are not always a guarantee against poverty, particularly for single mothers raising a family on one income, they significantly reduce the risk of social exclusion. Previous analyses of the Spanish Fertility and Family Survey 1995 showed that the probability of bearing a child outside marriage was significantly higher among women with primary education than among college-educated women (Castro-Martín 2007), following the pattern that has been observed in other societies (Kennedy 2004). Vital statistics data from 2007 confirm the existence of important educational differences between married and unmarried mothers: the proportion of mothers with a college education is 32.7% among the former and 16.1% among the later (Table 1). Although we cannot examine trends in the educational composition of unmarried mothers using vital statistics –due to the lack of data for this variable before 2007– when we compare the proportion of unmarried mothers with a professional or technical occupation, which usually requires a college degree, we observe an important increase: from 5.2% in 1980 to 11.8% in 2007. The overall participation of unmarried mothers in the labour market has also increased significantly over time –although at a slower pace than that of married women. The proportion of unmarried mothers classified as economically inactive decreased from 69.3% in 1980 to 47.9% in 2007.

In sum, as nonmarital childbearing has become more widespread, the sociodemographic profile of unmarried mothers has undergone a significant transformation. As in other societies, the term “single mother” was associated for a long

time with images of adolescent women having an unplanned first birth and whose subsequent life trajectories were largely conditioned by this event, often adversely – regarding their educational and labour market opportunities as well as their marriage prospects (Wu, Bumpass, and Musick 2001). Nowadays, however, there is not an homogeneous profile of unmarried mothers: nonmarital births occur within a wide age range but they are increasingly late, they are not necessarily first births, they may precede or follow a marriage, they are born to both unpartnered women and women living with the child's father, and they may speed up or slow down the transition to marriage. The changing profile of unmarried mothers could have important social implications. Maternal age, education and labour force attachment significantly reduce the economic, social and emotional vulnerability of unmarried mothers and, hence, the health and social disadvantages faced by their children (Foster, Jones, and Hoffman 1998).

## 3. Single motherhood as a sociodemographic risk factor for low birthweight

Birthweight is widely acknowledged in the literature as an important indicator of individual and population health (UNICEF and WHO 2004). Low birthweight is strongly associated with neonatal mortality and infant morbidity, and is also an important predictor of children's long-term health, psychological development and cognitive skills (Boardman et al. 2002, Jefferis, Power, and Hertzman 2002, Conley, Strully, and Bennett 2003, Reichman, 2005). Examining health inequalities at birth is hence relevant to understand subsequent inequalities from early childhood through adulthood.

A robust finding in demographic and epidemiological research is the large socio-economic disparities in low birthweight (Kramer et al. 2000). The association between maternal unmarried status and poor birth outcomes has also been reported by a large number of studies in different countries (Bennett 1992, Pattenden, Dolk, and Vrijheid 1999, Luo, Wilkins, and Kramer 2004, Raatikainen, Heiskanen, and Heinonen 2005, Meggiolaro 2009), including Spain (Rodríguez, Regidor, and Gutiérrez-Fisac 1995). The pathways through which marital status might influence pregnancy outcomes, including birthweight, are numerous and difficult to disentangle. Nevertheless, the literature offers some clues on the mediating mechanisms leading to adverse pregnancy outcomes among unmarried women. Several studies have shown that unmarried mothers usually face worse economic circumstances, experience greater psychological stress during pregnancy, and are less likely to seek timely prenatal care than married mothers, and all these factors increase the risk of preterm delivery and low birthweight

(Reime et al. 2006). Other studies have documented that maternal health and health-related behaviours, such as smoking during pregnancy, are worse among unmarried mothers compared to married mothers (Kiernan and Pickett 2006). Social support, and in particular emotional support from the baby's father, has also been shown to influence mothers' physical, emotional and reproductive health and, consequently, pregnancy outcomes (Hohmann-Marriott 2009). In fact, some studies have found that a woman's partnership duration and quality may be more relevant for infant health than her formal marital status (Bird et al. 2000). Pregnancy wantedness is also strongly associated with pregnancy outcomes and unmarried women are more likely to report pregnancies as unintended (Williams 1994).

Nevertheless, since the socioeconomic status, health-related behaviour and social support networks of unmarried mothers vary widely across cultural, social, and welfare contexts (Burstrom et al. 2010), the influence of marital status on perinatal health cannot be assumed to be analogous in all societies (Grimmer et al. 2002) In the case of Spain, it is unlikely that observed disparities in low birthweight between married and unmarried mothers result from differential access to health care, since the whole pregnant population is covered by high standard maternity care in the public health system. This asset should lower the risks of adverse pregnancy outcomes associated with unmarried status compared to other countries with no universal access to health care.

Likewise, the health disadvantages of unmarried women and their infants cannot be assumed to remain stable over time. As nonmarital childbearing becomes more commonplace, it is likely to become less selective of women with elevated risk factors for low birthweight, such as poor education, low social support or unintended pregnancy. In the case of Spain, we have documented in the previous section that, along with the marked increase in nonmarital childbearing in the past decade, there has been a substantial shift in the sociodemographic profile of unmarried mothers. A growing proportion of nonmarital births corresponds nowadays to older women. They are born to cohabiting parents or are legally acknowledged by non-resident fathers. The proportion of nonmarital births that correspond to foreign-born women has also risen sharply and former studies have shown that immigrant women tend to have more favorable birth outcomes than native women (Guendelman et al. 1999). The gap in educational attainment and labour force attachment between unmarried and married mothers has narrowed as well, reducing economic and social disparities. Furthermore, the fact that nearly half of all nonmarital births currently correspond to mothers over age 30 or that two-thirds are born into cohabiting unions suggests that a large proportion of these births are intended (Musick 2002), and prior studies have documented that planned pregnancies are associated with prenatal behaviours that lead to healthier birth outcomes (Kost, Landry, and Darroch 1998). Social and cultural

acceptance of nonmarital childbearing can also lessen the level of psychological stress linked to unmarried pregnancy and its detrimental effects on infant health.

In brief, unmarried and married mothers are currently more alike in terms of sociodemographic characteristics than in the past and, hence, we expect to find a weakening of the association between maternal marital status and birth outcomes. Moreover, as alternative family structures have become more widely accepted, less stigma from the community and less disapproval from the inner circle of friends and relatives are likely to benefit the health status of unwed mothers and their newborns. Increasing father involvement is also likely to reduce children's health disadvantages (Padilla and Reichman 2001). In this vein, a recent study found that marital status was no longer a significant predictor of the risk of preterm birth in those European countries where the nonmarital birth ratio was above 20% (Zeitlin et al. 2002).

Although the literature on the risk factors of adverse birth outcomes is copious, time trends in unmarried mothers' disadvantage in relation to low birthweight remains understudied. Furthermore, empirical results are far from uniform: the impact of marital status on pregnancy outcomes has diminished over time in some societies (Fairley 2005), but remained relatively stable in others (Luo, Wilkins, and Kramer 2004, Raatikainen, Heiskanen, and Heinonen 2005). Spain provides a good case study because the nonmarital birth ratio increased nearly three-fold in the past decade, and hence offers a good opportunity to test whether children's health disadvantages associated with mothers' unmarried status lessen when nonmarital childbearing shifts from a marginal to a relatively frequent behaviour.

Despite the widely acknowledged importance of social policies aimed at lessening social inequalities linked to family structure and at guaranteeing children's welfare independently of the type of household they live in (McLanahan 2004), Spain is one of the European countries that invests less in family-related support policies (1.2% of GDP in 2006 compared to the 2.1% average of the EU-25) and one of the few countries that has no specific policies directed at single-parent families. Therefore, the recent large increase in nonmarital childbearing has not been accompanied by any social policy aimed at attenuating the potential vulnerabilities faced by these families. However, it is plausible that the increasing social acceptance of nonmarital births, their growing prevalence across all social strata, the changing demographic composition of unmarried mothers, and rising unmarried fathers' involvement have themselves lessened some of the health disadvantages faced by nonmarital births in the past. Motivated by these considerations, we hypothesize that, despite a lack of social policies targeting unwed mothers, the relative importance of a mother's unmarried status as a risk factor for low birthweight has declined during the past decade.

## 4. Data and methods

This study uses data from the Spanish birth register from 1996 and 2007 to examine trends in low birthweight associated with mother's marital status. The birth microdata files are provided by the National Institute of Statistics and are based on the information collected in the statistical birth bulletin. This document is filled out by the infant's parents at the time of birth and is recorded in the civil register.

Since the establishment of the national vital registration system in 1871–and even before, in the parish registers– births within and outside marriage have been clearly differentiated, although the terms used and the legal and social consequences of this categorization have changed over time. In 1981 the concept of *illegitimate birth* disappears and birth statistics begin to record births to *married* mothers and *unmarried* mothers. In 2007, information on whether unmarried mothers are single, separated/divorced or widowed, and whether they are cohabiting with a partner, is collected for the first time.[4] The information on birth weight has been gathered since 1981.

A major strength of population-based register data is their complete coverage and high quality. A major weakness for social research purposes is that only a limited number of variables are collected in register data. For instance, no information on mothers' and fathers' education is recorded until 2007, limiting the study of social inequalities in nonmarital childbearing. Nevertheless, in the analysis we include the information available on mothers' and fathers' professional occupations as a proxy for college education.

In order to explore the health disadvantages of nonmarital births, we focus on a dimension of perinatal health, birthweight, for which reliable information is available in recent birth microdata.[5] Low birthweight is defined by the World Health Organization as less than 2,500 grams (or less than 5 lb, 8 oz.), regardless of period of gestation.[6] The analysis is restricted to singleton deliveries because multiple births, which are at high

[4] In 2007 there was a substantial change in the birth registration form, expanding the information collected. Mothers' legal marital status, cohabitating status and union duration, as well as mothers' and fathers' education and country of birth were recorded for the first time. Other new information includes mode of delivery (caesarean vs. vaginal birth) and the newborn's nationality.

[5] The data on birthweight exhibit some heaping on digits that are multiples of 500 grams, indicating that birthweights are usually rounded. However, heaping at 2,500 grams, the cut-off point for low birthweight, is not severe: 0.6 % of all infants in 2007. Therefore, there is no reason to believe that estimates of the prevalence of low birthweight are substantially biased downwards.

[6] Low birth weight can be the result of pre-term delivery (less than 37 weeks of gestation), intrauterine growth retardation, or both. In the case of Spain, 57.2% of all low weight births in 2007 were born before the 37th week of gestation. We include a dummy variable for pre-term delivery in the multivariate analyses.

risk of low birthweight,[7] are more frequent among married than unmarried women.[8] We also excluded from the analysis those births for which information on birth weight was missing (6% in 1996 and 4.7% in 2007). The final data set includes 332,376 births for 1996 and 451,111 births for 2007.

The analysis on birth weight focuses on the more recent period 1996-2007, because before 1996 the proportion of births with no weight recorded is relatively high (an average of 12.8% in 1990-1995) and no information on the mother's nationality is collected. Although this is a relatively short period, it should be noted that the nonmarital birth ratio nearly tripled during this time span (from 11.7% in 1996 to 30.2% in 2007).

Our focus of interest is the relationship between marital status and low birthweight. Marital status refers to the moment of birth –not conception– and is categorized as married and unmarried, but for 2007 an additional category for cohabiting women is added. A number of socio-demographic characteristics whose association with low birthweight has been documented in the literature are also included in the analyses as potential confounders (Valero de Bernabé et al. 2004). However, the variables that could be included in such analyses were limited to those collected on birth certificates: mother's age, labor force status and professional occupation, nationality and town size, and newborn's sex, birth order and pre-term delivery. The presence of information on father's age in the birth certificate is also used as a proxy for paternity acknowledgement.

Logistic regression techniques are used to examine differentials in the probability of delivering a low weight birth by mother's marital status, before and after controlling for the socio-demographic covariates mentioned above. Unadjusted and adjusted odds ratios and 95% confidence intervals are presented in the tables of results.

## 5. Results

The prevalence of low birthweight infants has increased notably in Spain during the past two decades: from 5.2% in 1990 to 8% in 2007. The current proportion of low weight births is above the OECD average (6.8%), and well above the level in Nordic

[7] In 2007, 61.6% of multiple births had low birthweight compared with 5.8% of singletons.

[8] The percentage of multiple births has increased over time: from 2.5% in 1996 to 3.9% in 2007, partly as a consequence of the increasing recourse to assisted reproduction techniques (Andersen et al. 2008). Although assisted reproductive technologies are available to any woman, whether married or not, through the Spanish national healthcare system, multiple births are more common among married women (4.3% in 2007) than unmarried women (2.9% in 2007).

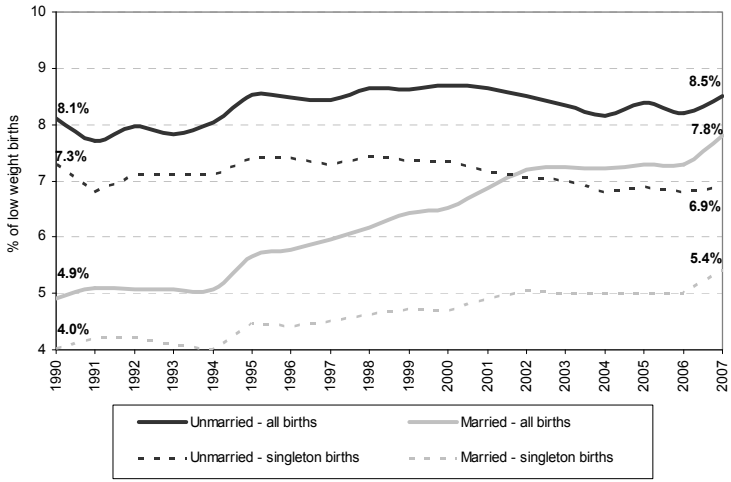
countries (less than 4.5%) (EURO-PERISTAT 2008). The recent upward trend in low birthweight goes against what we would expect to observe, given the improvement in living standards and health care, but it has also been observed in several developed countries (OECD 2009). The epidemiological literature offers some explanations for this apparent paradox. First, the number of multiple births, which have a substantially higher risk of low birthweight, has risen steadily, partly as a result of more frequent fertility treatments (Blondel et al. 2002, Daltveit et al. 1999). Second, the proportion of first births –also at higher risks of low birthweight– among all births has also been increasing. Other factors which may have influenced the rise in low birthweight are older age at childbearing[9] (Luque Fernández 2008), and increased use of induction of labour and caesarean delivery (Silva et al. 2004). The rising prevalence of smoking among pregnant women is another factor which has been hypothesized to partly account for the rise in low weight births (Martínez Frías et al. 2005).

With regard to the differentials in low birthweight by mother's marital status, Figure 2 reveals that, when we take into account all births, the gap narrows over time, but the observed convergence between unmarried and married mothers is mainly due to the combination of an upward trend in low birthweight among married women (from 4.9% in 1990 to 7.8% in 2007) and a relative stability among unmarried women (around 8.0-8.5%), not to a downward trend in low birthweight among unmarried women. Since these trends are partly linked to the higher probability of having multiple births among married women, from now on we restrict the analysis to singleton live births in order to avoid the potential confounding effect of multiple gestations. When we confine the comparison to singleton deliveries, a narrowing of the gap in low birthweight between unmarried and married mothers can also be observed. Whereas in 1990 the proportion of low weight births among unmarried women (7.3%) nearly doubles that of married women (4%), in 2007 differentials have lessened (6.9% vs. 5.4%).

Figure 3 displays the unadjusted odds ratios of low birthweight for unmarried mothers relative to married mothers for the more recent period: 1996 to 2007. The declining significance of maternal marital status as a risk factor of low birth weight is evident: unmarried women's odds of delivering a low weight birth were 73% higher than their married counterparts in 1996, but only 31% higher in 2007. The reduction in relative risks has been sustained throughout the period under study. Nevertheless, despite diminishing differentials, low weight births still remain more frequent among unmarried mothers than among their married counterparts.

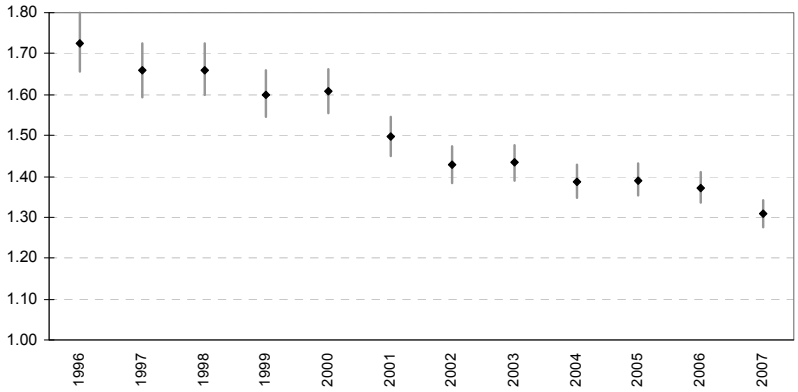
[9] The proportion of live births to mothers older than 35 has increased from 10.4% in 1990 to 25.5% in 2007.

**Figure 2: Trends in the proportion of low weight births by mother's marital status, 1990-2007**




*Source*: Birth microdata 1990-2007.

**Figure 3: Unadjusted odds ratios and 95% confidence intervals from logistic regression for low birthweight among unmarried mothers (compared to married mothers), 1996-2007**




*Note*: The analysis is restricted to singleton births.

Observed differentials could be partly conditioned by the dissimilar sociodemographic composition of unmarried and married mothers. In order to take into account potential confounding factors, we perform a logistic regression analysis of the influence of maternal marital status on the risk of having a low weight birth in 1996 and in 2007, controlling for a number of sociodemographic characteristics of the mother, the father and the newborn.

Table 2 provides the adjusted odds ratios from the logistic regression models on low birthweight. Differentials in infant's low weight by mother's marital status attenuate once the compositional variables are introduced in the model, particularly in 1996 (Unadjusted OR of 1.73 vs. Adjusted OR of 1.44), but also in 2007 (Unadjusted OR of 1.31 vs. Adjusted OR of 1.20). These results suggest that part of the observed differentials in low birthweight by maternal marital status can be attributed to the dissimilar sociodemographic composition of unmarried and married mothers. For instance, compared to their married counterparts, unmarried mothers are more likely to be primiparous, to have a premature delivery, to be out of the labour market, to have a non-professional occupation and to live in a large town (Table 1), and these are all factors that increase the risk of low birthweight (Rodríguez, Regidor, and Gutiérrez-Fisac 1995). Unmarried mothers have, on the other hand, some "protective" compositional factors in relation to low birthweight, such as a younger average age and a higher likelihood of being foreign-born. Congruent with former studies on immigrant women's birth outcomes, our models show that foreign women –from both developed and developing countries– residing in Spain have lower risks of low birthweight than native women. Nevertheless, although attenuated after adjusting for sociodemographic characteristics, the increased risk of low birthweight associated with unmarried motherhood remains statistically significant.

Model 1 for 2007 did not include mother's cohabiting status and education in order to use the same variables as in the model for 1996, but we did incorporate these variables into Model 2 with two objectives: first, to examine whether the birthweight outcomes of cohabiting mothers are closer to those of married mothers or lone mothers; second, to assess whether part of the elevated risks of low birthweight among unmarried women are attributable to their lower educational attainment. With regard to the first issue, Model 2 suggests that, compared to married mothers, the odds of having a low weight birth are significantly higher both among cohabiting mothers and lone mothers, although slightly higher among the latter. Former studies have found a gradient effect of increased risk for adverse birth outcomes from married mothers to unmarried mothers with partners to unmarried mothers without partners in several societies (Luo, Wilkins, and Kramer 2004, Young and Declercq 2009). Our results, however, do not reflect substantial differentials between cohabiting and lone mothers. Hence, in spite of

## Table 2: Odds ratios (OR) and 95% confidence intervals (CI) from logistic regressions predicting low birthweight, 1996 and 2007

| | | 1996 | | 2007 | | | |
|---|---|---|---|---|---|---|---|
| | | | | Model 1 | | Model 2 | |
| | | Adjusted OR | 95% CI | Adjusted OR | 95% CI | Adjusted OR | 95% CI |
| *Mother's* | | | | | | | |
| Marital status | (Married) | 1.00 | | 1.00 | | | |
| | Unmarried | 1.44 *** | (1.37, 1.53) | 1.20 *** | (1.16, 1.24) | | |
| Union status | (Married) | | | | | 1.00 | |
| | Cohabiting | | | | | 1.16 *** | (1.12, 1.20) |
| | Lone mother | | | | | 1.20 *** | (1.14, 1.26) |
| Age | <20 | 0.84 ** | (0.76, 0.94) | 1.09 | (1.00, 1.18) | 1.05 | (0.96, 1.14) |
| | (20-24) | 1.00 | | 1.00 | | 1.00 | |
| | 25-29 | 0.96 | (0.90, 1.02) | 1.05 | (0.99, 1.10) | 1.09 ** | (1.03, 1.15) |
| | 30-34 | 1.02 | (0.96, 1.09) | 1.09 ** | (1.03, 1.15) | 1.17 *** | (1.10, 1.23) |
| | 35-39 | 1.17 *** | (1.08, 1.26) | 1.23 *** | (1.16, 1.30) | 1.32 *** | (1.24, 1.40) |
| | 40+ | 1.20 ** | (1.05, 1.38) | 1.40 *** | (1.29, 1.52) | 1.49 *** | (1.38, 1.62) |
| Labor force status | (Inactive) | 1.00 | | 1.00 | | 1.00 | |
| | Professional | 0.78 *** | (0.73, 0.83) | 0.84 *** | (0.80, 0.88) | 0.93 ** | (0.89, 0.98) |
| | Other occupation | 0.91 *** | (0.87, 0.95) | 0.93 *** | (0.90, 0.96) | 0.95 ** | (0.92, 0.99) |
| Nationality | (Spanish) | 1.00 | | 1.00 | | 1.00 | |
| | Europe & MDCs | 0.88 | (0.73, 1.05) | 0.87 *** | (0.82, 0.93) | 0.88 *** | (0.82, 0.93) |
| | LDCs | 0.81 ** | (0.71, 0.92) | 0.73 *** | (0.70, 0.76) | 0.71 *** | (0.67, 0.74) |
| Town size | (<20,000) | 1.00 | | 1.00 | | 1.00 | |
| | 20,000-100,000 | 1.02 | (0.97, 1.07) | 1.00 | (0.96, 1.04) | 1.01 | (0.97, 1.04) |
| | 100,000+ or capital | 1.12 *** | (1.07, 1.17) | 1.04 * | (1.01, 1.08) | 1.06 ** | (1.02, 1.10) |
| Education | (Primary) | | | | | 1.00 | |
| | Secondary I | | | | | 0.90 *** | (0.86, 0.94) |
| | Secondary II | | | | | 0.83 *** | (0.79, 0.87) |
| | University | | | | | 0.72 *** | (0.68, 0.77) |
| *Father's* | | | | | | | |
| Birth certificate info. | No age reported | 1.20 ** | (1.05, 1.38) | 1.13 * | (1.02, 1.24) | 1.10 | (0.99, 1.22) |
| Occupation | Professional | 0.84 *** | (0.79, 0.89) | 0.88 *** | (0.84, 0.91) | 0.92 *** | (0.88, 0.95) |
| *Newborn's* | | | | | | | |
| Sex | (Boy) | 1.00 | | 1.00 | | 1.00 | |
| | Girl | 1.44 *** | (1.39, 1.50) | 1.43 *** | (1.39, 1.47) | 1.43 *** | (1.39, 1.47) |
| Birth order | (1) | 1.00 | | 1.00 | | 1.00 | |
| | 2 | 0.70 *** | (0.67, 0.73) | 0.73 *** | (0.70, 0.75) | 0.72 *** | (0.69, 0.74) |
| | 3+ | 0.77 *** | (0.72, 0.82) | 0.75 *** | (0.72, 0.79) | 0.72 *** | (0.69, 0.76) |
| Gestational age | (Full-term) | 1.00 | | 1.00 | | 1.00 | |
| | Pre-term | 45.41 *** | (43.61, 47.29) | 29.62 *** | (28.75, 30.51) | 29.47 *** | (28.60, 30.35) |
| *-2 log likelihood* | | *94669.803* | | *152092.118* | | *151957.501* | |
| *df* | | *18* | | *18* | | *23* | |
| *N* | | *332376* | | *451111* | | *451111* | |

*Notes*: The analysis is restricted to singleton births. Births with unknown weight are excluded. Reference categories are in parentheses. * p<.05, ** p<.01, *** p<.001

presumably greater father involvement throughout the pregnancy, cohabiting mothers in Spain are closer to lone mothers than to married mothers in terms of low birthweight risks.

Regarding the mediating effect of mother's education, Model 2 suggests that the impact of educational level is in the direction expected –higher educational attainment reduces the odds of low birthweight–, but its inclusion in the model only slightly reduces the effect of union status on birth outcomes.[10] The lower educational attainment of unmarried mothers, hence, can only partially account for the observed gap in birth outcomes. Nevertheless, the inclusion of an interaction between marital status and education in the model reveals that maternal education modifies the impact of marital status on low birthweight risks.[11] The results of the interaction, displayed in Table 3, show that differentials in low birthweight by marital status are substantially larger among low educated women than highly educated women. In fact, the risk of delivering a low weight birth among college-educated women does not differ significantly for married and unmarried mothers.

**Table 3: Unadjusted and adjusted odds ratios (OR) and 95% confidence intervals (CI) from logistic regression predicting low birthweight. Interaction between marital status and education**

| | Unadjusted OR | 95% CI | Adjusted OR | 95% CI |
|---|---|---|---|---|
| *Marital status * Education* | | | | |
| Married and less than Secondary | 1.35 *** | (1.28, 1.42) | 1.34 *** | (1.25, 1.44) |
| Married and Secondary | 1.17 *** | (1.13, 1.22) | 1.14 *** | (1.09, 1.19) |
| (Married and University) | 1.00 | | 1.00 | |
| Unmarried and less than Secondary | 1.83 *** | (1.74, 1.93) | 1.57 *** | (1.47, 1.69) |
| Unmarried and Secondary | 1.48 *** | (1.42, 1.53) | 1.38 *** | (1.31, 1.46) |
| Unmarried and University | 1.07 | (1.00, 1.14) | 1.05 | (0.98, 1.13) |

*Notes*: The multivariate model controls for all covariates of Model 1 in Table 2. *** p<.001

[10] The contrast between unmarried women (regardless of cohabiting status) and married women is also slightly attenuated once educational composition is taken into account (Adjusted OR of 1.17 when education is included in the model vs. Adjusted OR of 1.20 when it is not included).

[11] In order to simplify the interpretation of the interaction between marital status and education, the categories Secondary I and Secondary II are collapsed into one category. Interactions of marital status with age and labor force status were also tested, but they were not statistically significant.

Regarding the time trends in the effect of maternal marital status on newborns' low weight, the comparison of the model for 1996 and Model 1 for 2007 –which includes the same covariates– reveals that the weakening influence of marital status on the risk of low birthweight reflected in the unadjusted odds ratios can also be observed after the sociodemographic composition of unmarried and married mothers is controlled for. The adjusted odds of low birthweight were 44% higher among unmarried mothers relative to their married counterparts in 1996, but only 20% higher in 2007. We can conclude, hence, that the health disadvantages of unmarried mothers' newborns relative to married mother's newborns have lessened during the past decade.

**Table 4: Unadjusted and adjusted odds ratios (OR) and 95% confidence intervals (CI) from logistic regression predicting low birthweight. Interaction between marital status and year**

| | Unadjusted OR | 95% CI | Adjusted OR | 95% CI |
|---|---|---|---|---|
| *Marital status * Year* | | | | |
| (Unmarried 1996) | 1.00 | | 1.00 | |
| Unmarried 2007 | 0.93 *** | (0.89, 0.97) | 0.83 *** | (0.78, 0.87) |
| Married 1996 | 0.58 *** | (0.56, 0.60) | 0.66 *** | (0.63, 0.69) |
| Married 2007 | 0.71 *** | (0.68, 0.74) | 0.69 *** | (0.65, 0.72) |

*Notes*: The multivariate model controls for all covariates of Model 1 in Table 2. *** p<.001

In order to test the statistical significance of this reduction, we pooled the 1996 and 2007 birth files and examined the interactions between marital status and year of birth. Table 4 presents the results of this analysis. According to these estimates, the observed risk of bearing a low weight infant among unmarried women declined 7% from 1996 to 2007, and the reduction was 17% after controlling for sociodemographic compositional factors. These results endorse our hypothesis of the weakening impact of maternal marital status on low birthweight. Although they should be taken with caution, because of the mediating influence of unmeasured factors, such as prenatal care use, maternal stress or social support, they provide supporting evidence for asserting that the increasing prevalence and 'normalization' of nonmarital childbearing has reduced the health disadvantage of unwed mothers' newborns relative to married mothers' newborns.

## 6. Conclusions

Over the last two decades, Spain has witnessed a remarkable increase in nonmarital childbearing, a reflection of the growing dissociation between marriage and motherhood. Despite the considerable influence that the Catholic Church retains on the education system and social habits, marriage has lost its traditional status as the near-exclusive context for bearing and raising children. Whereas only thirty years ago nonmarital childbearing was a marginal behaviour facing strong social disapproval, nowadays nearly 1 out of 3 births take place outside the framework of marriage and social acceptance of unmarried families is widespread. Although the current nonmarital birth ratio is lower than that prevailing in most Northern European countries, the recent pace of increase has been the most rapid among Southern European countries.

Not only has out-of-wedlock childbearing become more frequent, but the sociodemographic profile of unmarried mothers has undergone a significant transformation. Some of the changes in the demographic composition of unmarried mothers documented here could have important social implications. For instance, the fact that nearly half of nonmarital births currently occur to mothers over the age of 30 and approximately two-thirds to cohabiting mothers suggests that a substantial proportion of those births are planned and desired. These changes in the age profile and the conjugal situation of unmarried mothers, together with their increasing education and labour force participation, are likely to have favourable implications for children's well-being.

In this study we have examined to what extent mothers' marital status affects the health status of their newborns, using low birthweight as an indicator. Although birth statistics show that the low birthweight rate is consistently higher among unmarried than married mothers, the dissimilar sociodemographic composition of these groups suggests the need to assess health risks in a multivariate framework. The logistic regression analysis revealed that differentials in the risk of delivering a low birth weight infant by marital status lessen substantially after controlling for sociodemographic factors, although they remain sizable and statistically significant. Also, we found that among college-educated women, low birthweight risks do not differ significantly between married and unmarried mothers.

One of the main objectives of the study was to test whether children's health disadvantages associated with mothers' unmarried status had recently lessened. We argue that the increasing prevalence and social acceptance of nonmarital childbearing made it a less selective and stigmatizing experience, and that this should weaken the association between maternal marital status and low birthweight. The results of the analysis were congruent with the hypothesis posed and confirmed that the health

disadvantage gap between marital and nonmarital births narrowed significantly over the past decade.

Several limitations of this study should be noted. Common to other studies using vital registration data, we lack information on important medical, psychosocial and behavioural risk factors, such as maternal weight and health problems, pregnancy unwantedness at the time of conception, smoking habits or levels of stress. These unmeasured risk factors and behaviours may account for the observed disparities and trends. Further research is needed to elucidate the causal pathways that link marital status and pregnancy outcomes. Nevertheless, this study makes an important contribution by documenting the diminishing health disadvantage of unmarried women's newborns compared to married women's.

Despite these positive developments, unmarried women's infants still face higher health risks than those born to married women, a reflection of social inequities. In contrast to other European Union countries, Spain has not developed any social policy specifically aimed at improving the living conditions and health of unmarried mothers and their children. Nevertheless, it is plausible that the recent increase in nonmarital births will promote a wide social debate on the vulnerabilities faced by unmarried families and create the political will to design a range of interventions and policy measures aimed at counteracting the health and social disadvantages still associated with nonmarital childbearing. Since the number of babies being born outside of a married family setting is expected to keep on growing, it is also important to continue monitoring health inequalities at birth.

## 7. Acknowledgements

This research is part of the project Diverse Families: Demographic and social implications of the growing variety in family contexts from an international perspective, financed by the National Plan for Scientific Research of the Spanish Ministry of Education and Science (Ref. CSO2009-11883). The comments and suggestions by two anonymous reviewers led to significant improvements in the manuscript and are greatly appreciated.

## References

Andersen, A.N., Goossens, V., Ferraretti, A.P., Bhattacharya, S., Felberbaum, R., Mouzon, J., Nygren, K.G., EIM Consortium, and ESHRE (2008). Assisted reproductive technology in Europe, 2004. Results generated from European registers by ESHRE. *Human Reproduction* 23(4): 756-771. doi:10.1093/humrep/den014.

Arango, J. (2000). Becoming a country of immigration at the end of the twentieth century: The case of Spain. In: King, R., Lazaridis, G., and Tsardanidis, C. (eds.). *Eldorado or Fortress? Migration in Southern Europe.* New York: St. Martin's Press: 253-276.

Baizán, P., Aassve, A., and Billari, F.C. (2003). Cohabitation, marriage, and first birth: The interrelationship of family formation events in Spain. *European Journal of Population* 19(2): 47-169.

Bennett, N.G., Bloom, D.E., and Miller, C.K. (1995). The influence of nonmarital childbearing on the formation of first marriages. *Demography* 32(1): 47-62. doi:10.2307/2061896.

Bennett, T. (1992). Marital status and infant health outcomes. *Social Science & Medicine* 35(9): 1179-1187. doi:10.1016/0277-9536(92)90230-N.

Billari, F.C., Castiglioni, M., Castro-Martín, T., Michielin, F., and Onagro, F. (2003). Household and union formation in a Mediterranean fashion: Italy and Spain. In: Klijzing, E. and Corijn, M. (eds.). *Comparative Research on Fertility and the Family in Contemporary Europe: Findings and Lessons from Comparative Research*, Vol. II. New York/Geneva: United Nations: 17-41.

Bird, S.T., Chandra, A., Bennett, T., and Harvey, S.M. (2000). Beyond marital status: Relationship type and duration and the risk of low birth weight. *Family Planning Perspectives* 32(6): 281-287. doi:10.2307/2648196.

Blondel, B., Kogan, M.D., Alexander, G.R., Dattani, N., Kramer, M.S., Macfarlane, A., and Wen, S.W. (2002). The impact of the increasing number of multiple births on the rates of preterm birth and low birth weight: An international study. *American Journal of Public Health* 92(8): 1323-1330. doi:10.2105/AJPH.92.8.1323.

Boardman, J.D., Powers, D.A., Padilla, Y.C., and Hummer, R.A. (2002). Low birth weight, social factors, and developmental outcomes among children in the United States. *Demography* 39(2): 353-368. doi:10.1353/dem.2002.0015.

Bumpass, L.L. and Lu, H.H. (2000). Trends in cohabitation and implications for children's family contexts in the United States. *Population Studies* 54(1): 29-41. doi:10.1080/713779060.

Burstrom, B., Whitehead, M., Clayton, S., Fritzell, S., Vannoni, F., and Costa, G. (2010). Health inequalities between lone and couple mothers and policy under different welfare regimes: The example of Italy, Sweden and Britain. *Social Science & Medicine* 70(6): 912-920. doi:10.1016/j.socscimed.2009.11.014.

Castro-Martín, T. (2005). Contraceptive use patterns among Spanish single youth. *The European Journal of Contraception and Reproductive Health Care* 10(4): 218-227. doi:10.1080/13625180500282379.

Castro-Martín, T. (2007). Maternidad sin matrimonio: nueva vía de formación de familias en España. Madrid: Fundación BBVA (Documento de Trabajo 16). http://www.fbbva.es/TLFU/dat/dt_16_maternidad.pdf.

Castro-Martín, T. and Dominguez-Folgueras, M. (2008). Matrimonios "sin papeles": Perfil sociodemográfico de las parejas de hecho en España según el Censo de 2001. *Política y Sociedad* 45(2): 51-72.

Christopher, K., England, P., McLanahan, S., Ross, K., and Smeeding, T.M. (2001). Gender inequality in poverty in affluent nations: The role of single motherhood and the state. In: Vleminckx, K. and Smeeding, T. (eds.). *Child Well-Being, Child Poverty and Child Policy in Modern Nations: What Do We Know?* London: Policy Press: 199-219.

Conley, D., Strully, K.W., and Bennett, N.G. (2003). *The Starting Gate: Birth Weight and Life Chances*. Berkeley, CA: University of California Press.

Daltveit, A.K., Vollset, S.E., Skjærven, R., and Irgens, L.M. (1999). Impact of multiple births and elective deliveries on the trends in low birth weight in Norway, 1967–1995. *American Journal of Epidemiology* 149(12): 1128-1133.

Domínguez-Folgueras, M. and Castro-Martín, T. (2008). Women's changing socioeconomic position and union formation in Spain and Portugal. *Demographic Research* 19(41): 1513-1550. http://www.demographic-research.org/Volumes/Vol19/41/. doi:10.4054/DemRes.2008.19.41.

EURO-PERISTAT Project (2008). *European Perinatal Health Report*. http://www.europeristat.com.

Fairley, L. (2005). Changing patterns of inequality in birthweight and its determinants: A population-based study, Scotland 1980–2000. *Paediatric and Perinatal Epidemiology* 19(5): 342-351. doi:10.1111/j.1365-3016.2005.00665.x.

Foster, E.M., Jones, D., and Hoffman, S.D. (1998). The economic impact of nonmarital childbearing: How are older, single mothers faring? *Journal of Marriage and the Family* 60(1): 163-174. doi:10.2307/353449.

Grimmer, I., Bührer, C., Dudenhausen, J.W., Stroux, A., Reiher, H., Halle, H., and Obladen, M. (2002). Preconceptional factors associated with very low birthweight delivery in East and West Berlin: A case control study. *BMC Public Health* 2: 10. http://www.biomedcentral.com/1471-2458/2/10. doi:10.1186/1471-2458-2-10.

Guendelman, S., Buekens, P., Blondel, B., Kaminski, M., Notzon, F.C., and Masuy-Stroobant, G. (1999). Birth outcomes of immigrant women in the United States, France and Belgium. *Maternal and Child Health Journa*l 3(4): 177-187. doi:10.1023/A:1022328020935.

Guzzo, K.B. (2009). Paternity establishment for men's nonmarital births. *Population Research and Policy Review* 28(6): 853-872. doi:10.1007/s11113-009-9131-z.

Heuveline, P., Timberlake, J.M., and Furstenberg, F.F. Jr. (2003). Shifting childrearing to single mothers: Results from 17 Western countries. *Population and Development Review* 29(1): 47-72. doi:10.1111/j.1728-4457.2003.00047.x.

Hirczy de Miño, W.P. (2000). From bastardry to equality: The rights of nonmarital children and their fathers in comparative perspective. *Journal of Comparative Family Studies* 31(2): 231- 262.

Hohmann-Marriott, B. (2009). The couple context of pregnancy and its effects on prenatal care and birth outcomes. *Maternal and Child Health Journal* 13(6): 745-754. doi:10.1007/s10995-009-0467-0.

Jefferis, B., Power, C., and Hertzman, C. (2002). Birth weight, childhood socioeconomic environment, and cognitive development in the 1958 British birth cohort study. *BMJ* 325(7359): 305-308. doi:10.1136/bmj.325.7359.305.

Kennedy, S. (2004). *Education and the formation of new families: a comparative study of cohabitation and nonmarital fertility in western nations.* Paper presented at the annual meeting of the Population Association of America, Boston, April 1-3, 2004.

Kiernan, K. (2001). The rise of cohabitation and childbearing outside marriage in Western Europe. *International Journal of Law, Policy and the Family* 15(1): 1-21. doi:10.1093/lawfam/15.1.1.

Kiernan, K. (2004). Unmarried cohabitation and parenthood in Britain and Europe. *Law & Policy* 26(1): 33-55. doi:10.1111/j.0265-8240.2004.00162.x.

Kiernan, K. and Pickett, K.E. (2006). Marital status disparities in maternal smoking during pregnancy, breastfeeding and maternal depression. *Social Science & Medicine* 63(2): 335-346. doi:10.1016/j.socscimed.2006.01.006.

Kost, K., Landry, D.J., and Darroch, J.E. (1998). The effects of pregnancy planning status on birth outcomes and infant care. *Family Planning Perspectives* 30(5): 223-230. doi:10.2307/2991608.

Kramer, M.S., Séguin, L., Lydon, J., and Goulet, L. (2000). Socio-economic disparities in pregnancy outcome: Why do the poor fare so poorly? *Paediatric and Perinatal Epidemiology* 14(3): 194-210. doi:10.1046/j.1365-3016.2000.00266.x.

Lichter, D.T. (1995). The retreat from marriage and the rise in nonmarital fertility. In: *Report to Congress on Out-of-Wedlock Childbearing*. Hyattsville, MD: Department of Health and Human Services, DHHS Pub. No. (PHS) 95-1257: 137-146.

Luo, Z.C., Wilkins, R., and Kramer, M.S. (2004). Disparities in pregnancy outcomes according to marital and cohabitation status. *Obstetrics and Gynecology* 103(6): 1300-1307.

Luque Fernández, M.A. (2008). Evolución del riesgo de mortalidad fetal tardía, prematuridad y bajo peso al nacer, asociado a la edad materna avanzada, en España (1996-2005). *Gaceta Sanitaria* 22: 396-403. doi:10.1157/13126919.

Manning, W.D. (1995). Cohabitation, marriage and entry into motherhood. *Journal of Marriage and Family* 57(1): 191-200. doi:10.2307/353827.

Manning, W.D., Smock, P., and Majumdar, D. (2004). The relative stability of cohabiting and marital unions for children. *Population Research and Policy Review* 23(2): 135-159. doi:10.1023/B:POPU.0000019916.29156.a7.

Martínez Frías, M.L., Rodríguez Pinilla, E., Bermejo Sánchez, E., and Grupo Periférico del ECEMC (2005). Consumo de tabaco durante el embarazo: análisis por años, comunidades autónomas y características maternas. *Medicina Clínica* 124(3): 86-92. doi:10.1157/13070863.

McLanahan, S. (2004). Diverging destinies: How children are faring under the second demographic transition. *Demography* 41(4): 607-627. doi:10.1353/dem.2004.0033.

McLanahan, S. and Sandefur, G. (1994). *Growing Up with a Single Parent: What Hurts, What Helps?* Cambridge, MA: Harvard University Press.

Meggiolaro, S. (2009). Low birth weight and parental resources in Italy. *Genus* 65(1): 103-121.

Muñoz-Pérez, F. (2003). Tener hijos sin casarse. *Sistema* 175-176: 67-85.

Musick, K. (2002). Planned and unplanned childbearing among unmarried women. *Journal of Marriage and the Family* 64(4): 915-929. doi:10.1111/j.1741-3737.2002.00915.x.

Nash, M. (1991). Pronatalism and motherhood in Franco's Spain. In: Bock, G. and Thame, P. (eds.). *Maternity and Gender Policies: Women and the Rise of the European Welfare States, 1880s-1950s*. London: Routledge: 160-177.

OECD (2009). *Health at a Glance 2009: OECD Indicators*. OECD Publishing. http://dx.doi.org/10.1787/health_glance-2009-en.

Padilla, Y.C. and Reichman, N.R. (2001). Low birthweight: Do unwed fathers help? *Children and Youth Services Review* 23 (4/S): 427-452.

Pattenden, S., Dolk, H., and Vrijheid, M. (1999). Inequalities in low birth weight: Parental social class, area deprivation, and "lone mother" status. *Journal of Epidemiology and Community Health* 53(6): 355-358. doi:10.1136/jech.53.6.355.

Raatikainen, K., Heiskanen, N., and Heinonen, S. (2005). Marriage still protects pregnancy. *BJOG: An International Journal of Obstetrics and Gynaecology* 112(10): 1411-1416. doi:10.1111/j.1471-0528.2005.00667.x.

Raley, K.R. (2001). Increasing fertility in cohabiting unions: Evidence for the second demographic transition in the United States? *Demography* 38(1): 59-66. doi:10.1353/dem.2001.0008.

Reichman, N.E. (2005). Low birth weight and school readiness. *The Future of Children* 15(1): 91-116. doi:10.1353/foc.2005.0008.

Reime, B., Ratner, P.A., Tomaselli-Reime, S.N., Kelly, A., Schuecking, B.A., and Wenzlaff, P. (2006). The role of mediating factors in the association between

social deprivation and low birth weight in Germany. *Social Science & Medicine* 62(7): 1731-1744. doi:10.1016/j.socscimed.2005.08.017.

Revuelta, B. and Villuendas, B. (2008). *Bastards and foundlings: Child abandonment, retrieval and illegitimacy in Madrid during the early 20th century*. Paper presented at the European Social Science History Conference, Lisbon, February 28 – March 1, 2008.

Rodríguez, C., Regidor, E., and Gutiérrez-Fisac, J.L. (1995). Low birth weight in Spain associated with sociodemographic factors. *Journal of Epidemiology and Community Health* 49(1): 38-42. doi:10.1136/jech.49.1.38.

Roig, M. and Castro-Martín, T. (2007). Childbearing patterns of foreign women in a new immigration country: The case of Spain. *Population* 62(3): 351-380.

Ruiz Salguero, M., Cabré, A., Castro Martín, T., and Solsona, M. (2005). *Anticoncepción y Salud Reproductiva en España: crónica de una (r)evolución*. Madrid: CSIC, Colección de Estudios Ambientales y Socioeconómicos nº 6.

Seltzer, J.A. (2000). Families formed outside of marriage. *Journal of Marriage and the Family* 62(4): 1247-1268. doi:10.1111/j.1741-3737.2000.01247.x.

Sigle-Rushton, W. and McLanahan, S. (2002). The living arrangements of new unmarried mothers. *Demography* 39(3): 415-433. doi:10.1353/dem.2002.0032.

Silva, A., Barbieri, M., Bettiol, H., Goldani, M., and Rona, R. (2004). Can we explain why Brazilian babies are becoming lighter? *International Journal of Epidemiology* 33(4): 821-828. doi:10.1093/ije/dyh101.

United Nations Children's Fund (UNICEF) and World Health Organization (WHO) (2004). *Low Birthweight: Country, regional and global estimates.* New York: UNICEF. http://www.unicef.org/publications/index_24840.html.

Valero de Bernabé, J., Soriano, T., Albaladejo, R., Juarranz, M., Calle, M.E., Martínez, D., and Domínguez-Rojas, V. (2004). Risk factors for low birth weight: a review. *European Journal of Obstetrics and Gynecology and Reproductive Biology* 116(1): 3-15. doi:10.1016/j.ejogrb.2004.03.007.

Whitehead, M., Burström, B., and Diderichsen, F. (2000). Social policies and the pathways to inequalities in health: A comparative analysis of lone mothers in Britain and Sweden. *Social Science & Medicine* 50(2): 255-270. doi:10.1016/S0277-9536(99)00280-4.

Williams, L.B. (1994). Determinants of couple agreement in U.S. fertility decisions. *Family Planning Perspectives* 26(4): 169-173. doi:10.2307/2136242.

Wu, L.L., Bumpass, L.L., and Musick, K. (2001). Historical and life course trajectories of nonmarital childbearing. In: Wu, L.L. and Wolfe, B. (eds.). *Out of Wedlock: Causes and Consequences of Nonmarital Fertility.* New York: Russell Sage Foundation: 3-48.

Wu, L.L. and Wolfe, B. (2001). *Out of Wedlock: Causes and Consequences of Nonmarital Fertility*. New York: Russell Sage Foundation.

Young, R.L. and Declercq, E. (2010). Implications of subdividing marital status: Are unmarried mothers with partners different from unmarried mothers without partners? An exploratory analysis. *Maternal and Child Health Journal* 14(2): 209-214. doi:10.1007/s10995-009-0450-9.

Zeitlin, J.A., Saurel-Cubizolles, M.J., Ancel, P.Y., and the EUROPOP Group (2002). Marital status, cohabitation, and the risk of preterm birth in Europe: Where births outside marriage are common and uncommon. *Paediatric and Perinatal Epidemiology* 16(2): 124-130. doi:10.1046/j.1365-3016.2002.00396.x.